

ORDER NO. 92-029

WASTE DISCHARGE REQUIREMENTS FOR:

U. S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
HAMILTON AIR FORCE BASE, LANDFILL 26
NOVATO, MARIN COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (herein called the Board) finds that:

1. The U. S. Army Corps of Engineers (CoE), Omaha District Office (hereinafter the discharger) has been designated by the Department of Defense to perform necessary investigations and take appropriate remedial action relative to Landfill 26 on the Hamilton Air Force Base.
2. Hamilton Air Force Base (HAFB) is located east of Highway 101 in Marin County, near the towns of Ignacio and Novato (Figure 1). The facility opened in 1934 as an Army Air Corps facility to train fighter and bomber pilots. The field was transferred in 1947 to the U. S. Air Force from the Army. The Base was used for pilot training, submarine surveillance and aircraft maintenance.
3. HAFB was listed in 1974 as excess property. Base Command was transferred from military command to civilian managers. The Department of Defense withdrew the housing area portion of the base from the excess property listing and transferred that portion to the U.S. Navy. The Army received permission in 1976 from the USAF to use the runway and other ancillary facilities for aircraft operation. Also in 1976 the State of California determined that lands subject to tidal action belong to the State. Consequently a portion of the land outside the levees that encircle the site were claimed by the State.
4. This order addresses Landfill 26 located on HAFB. The landfill encompasses an area of approximately 28 acres and together with a buffer zone comprises an area of approximately 47 acres in extent. The landfill is one element of concern at HAFB. Other sites at HAFB of water quality concerns have been studied by the CoE and reported in separate Remedial Investigations (RI). Additional Board action may be required at HAFB, pending review of the RI, in late 1991.

Landfill Characteristics

5. The Landfill consists of numerous individual discharges of solid and hazardous wastes dispersed over an extended period of time over a large area, designated as Landfill 26. The Landfill is located within a topographically low area of a pre-existing surface drainage channel. Investigations on the Landfill show that maximum thickness of the wastes is 10 feet, but appears to be absent at other locations within the Landfill. Groundwater saturates parts of the wastes, which may result in contamination of circulating ground water.
6. The Landfill stopped receiving wastes in the mid 1970s; however, the Landfill has not been properly closed.
7. Chemical contaminants identified in soil borings consist of volatile and semi-volatile organics, pesticides and PCBs, petroleum hydrocarbons and heavy metals. Groundwater samples showed the presence of polynuclear aromatic hydrocarbons together with low levels of heavy metals and varying levels of total dissolved solids (TDS) consisting chiefly of calcium, magnesium and sulfate naturally present in the groundwater.

Legal Basis

8. The discharger prepared a remedial action plan for the landfill described in the Record of Decision (RoD), dated August 11, 1989 with modifications described in the draft Explanation of Significant Difference (ESD), dated May 10, 1991. The RoD and the work to be performed is mandated under the authority of the Defense Environmental Restoration Program, Title 10 United States Code Section 2701 et seq., and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Title 42, United States Code Section 9601, et. seq., the Superfund Law. Executive Order # 12580 designates the Department of Defense (DOD) as lead agency for implementation of CERCLA regulations on property under DOD control. CERCLA requires that a final Record of Decision be issued after public review and comment. CERCLA permits modification of the remedial action plan through issuance of the ESD for significant but not fundamental changes to be made to the RoD.

Proposed Remedial Alternatives in RoD

9. The RoD dated August 11, 1989, presented eight alternative cleanup and closure proposals as follows:
 - a. No action. Groundwater monitoring only.
 - b. Excavation of entire landfill.
 - c. In-place closure. Barriers against migrating groundwaters; Slurry wall construction.
 - d. Soil/refuse fixation and Class II closure.

- e. Class I waste excavation and Class II closure.
- f. Soil washing and Class II closure.
- g. Biological treatment of waste and commercial landfill disposal
- h. Fixation and Class I closure.

All alternatives would be implemented in conjunction with groundwater extraction and treatment except Alternative a.

The preferred alternative in the RoD was Alternative d. - Chemical fixation of hot spots within the landfill and covering the landfill with a low permeability cap.

Proposed Alternatives in ESD

- 10. In May 1991 the discharger issued a draft "Explanation of Significant Differences". Pre-design soil and groundwater sampling activities at the site furnished significant new information leading to the proposed changes of the selected remedies. The ESD proposed elimination of the chemical fixation of the landfill but more stringent design specifications for the cap. Chemical fixation was considered inappropriate because elevated concentrations of waste constituents were found to be present only in a small percentage of samples within the landfill rather than throughout the landfill or in locatable zones. The original cap specifications were tightened to compensate for elimination of fixation. The capping of the landfill together with groundwater extraction were considered by the discharger to provide an equivalent level of environmental protection compared to that provided by the original plan contained in the RoD.
- 11. The plan concept as contained in the ESD is an acceptable method of closure provided the necessary additional field investigations and design studies required by this Order are completed first.

Requirements of Order

- 12. This Order requires the discharger to close the landfill and treat contaminated groundwater. A hydraulic containment system and a landfill cover shall be installed. On-going groundwater monitoring is required by the Order to evaluate and monitor the effectiveness of the above remedial action.
- 13. Soil and groundwater studies have been conducted within the area of the original size of the landfill. Investigations of the area outside the landfill must be conducted to clearly indicate groundwater migration pathways and gradients to permit remediation strategies to be implemented.

Hydraulic Containment

14. Pump test to determine the extent of capture zones of extraction wells and overlap of cones of depression of pumping wells must be established in Phase II, within the landfill, and within the buffer zone after establishment of all migration pathways from the landfill.

15. Within Landfill

Two different types of groundwater extraction systems to optimize cleanup should be installed. An extraction well system within the landfill designed to lower the water table within the landfill and minimize saturation of wastes, should serve to minimize leachate formation and reduce mobility of waste constituents within groundwater. Pump test must be conducted within the landfill to determine the feasibility and effectiveness of this system and determine necessary capacity of the groundwater treatment plant.

16. Plume Capture Extraction System

An interim groundwater extraction system along the downgradient perimeter of the landfill will be installed to capture leachate and to intercept contaminated groundwater which may migrate off-site. Detailed hydrogeologic studies must be conducted in Phase I within the buffer zone of the landfill by installing monitoring wells. Lithologic investigations to determine that well completion zones are within the migration paths of contaminants and are capable of yielding groundwater must be performed. Pump tests of adequate duration to establish the feasibility of groundwater extraction must be performed. Adequately spaced piezometers must be installed to aid in determination of the efficiency of the system. Measurement of volumes of extractable groundwater both from within the landfill and buffer zones must be established to aid in the design and construction of an adequately sized groundwater treatment plant capable of treating the extracted groundwater volume. After installation of the extraction system, monitoring wells must be installed downgradient of the system to determine the effectiveness of the system. The interim groundwater extraction system and the in-waste extraction will be evaluated and modified if necessary based on groundwater monitoring data collected.

Landfill Cover

17. The landfill cover must follow performance standards, capable of preventing infiltration. The California Code of Regulations, Title 23, Chapter 3, Section 2581 specify the requirements of the cover design.

Groundwater Treatment and Disposal

18. Resolution 88-160, adopted by the Regional Board, strongly encourages the maximum feasible reuse of extracted groundwater from groundwater pollution remediation either by the discharger or other public or private water users. Consideration and implementation of Resolution 88-160 by the discharger is required by Provision C.4.f.
19. Bench scale testing using extracted groundwater from the site have been conducted together with a literature search to determine a viable groundwater treatment system. Treated groundwater must meet the National Pollution Discharge Elimination System (NPDES) effluent limitations if there is discharge to San Pablo Bay or it must meet the treatment standards for discharge to the Novato Sanitary District.
20. ReInjection of the treated groundwater was originally proposed for disposal of the water, but the discharger is currently considering direct discharge to surface waters. If reInjection is to be implemented, permeability and transmissivity of areas selected for re-injection sites must be determined. Adequate pump and re-injection tests to determine quantities of groundwater potentially to be extracted both during wet and dry seasons must be determined to permit an adequate number of re-injection wells to be installed capable of accepting such water quantities as are produced, without causing undue groundwater mounding, in the event this disposal method is chosen. Adjustments to the system may be required after adequate testing. Discussions of possible disposal of treated groundwater to the Novato Publicly Owned Treatment Works (POTW) for further treatment or discharge through the POTWs outfall, must be further pursued.

Wetlands

21. About 4.1 acres of wetlands will be filled or degraded in value as a result of landfill capping and modification of existing drainage. A conceptual mitigation plan has been proposed by U.S. CoE San Francisco District. The conceptual plan is comprised of both off-site and on-site wetland restoration to achieve replacement of the seasonal and perennial marsh communities which presently exist.

The objectives of the mitigation are to establish appropriate elevations and hydrologic conditions, revegetate and establish wildlife use.

Post wetland construction must include sampling and surveys of soils, vegetation and wildlife to evaluate the success of the wetland restoration project.

Flood Control

22. The report titled: "Environmental Assessment for the Closure and Realignment of Hamilton Army Airfield, CA" prepared by the U.S. Army Corps of Engineers, Sacramento District, dated September 1991, briefly mentions the need for reconstruction of perimeter levees, rehabilitation of the pump stations and associated steps necessary to be taken to control potential base flooding problems. Further studies and necessary steps must be taken to prevent flooding of the landfill and cover washout.
23. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on December 17, 1986. This Order implements the water quality objectives stated in the Basin Plan.
24. The existing and potential beneficial uses of San Pablo Bay in the vicinity of the site are:
 - a. Industrial service supply
 - b. Navigation
 - c. Commercial and sport fishing
 - d. Contact and non-contact water recreation
 - e. Wildlife and estuarine habitat
 - f. Fish migration and spawning
 - g. Preservation of rare and endangered species
25. The existing and potential beneficial uses of groundwater in the vicinity of the site are:
 - a. Industrial service supply
 - b. Domestic water supply
26. The action to issue Waste Discharge Requirements for continued operation of existing waste management units is exempt from the California Environmental Quality Act (Public Resources Section 2100 et. seq.) in accordance with Section 15301, Chapter 3, Title 14 of the California Code of Regulations.
27. The Board notified the discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
28. The Board in a public hearing heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, that the U.S. Army Corps of Engineers, its agents, successors and assigns in order to meet the provisions contained in Division 7 of the California Water Code and

regulations adopted thereunder, shall comply with the following:

A. Prohibitions

1. The treatment, discharge or storage of wastes or materials shall not be allowed to create a condition of pollution or nuisance as defined in Sections 13050 (1) (m), of the California Water Code.
2. Migration of pollutants through subsurface transport to waters of the State is prohibited.
3. There shall be no discharge of wastes to surface waters except as permitted under the National Pollutant Discharge Elimination System (NPDES).
4. Any future uses of the landfill area that would compromise the integrity the landfill cover are prohibited.
5. Filling of the wetland due to any construction activities is prohibited unless wetland mitigation plan has been approved by the Executive Officer.

B. Specifications

Unless otherwise noted, any references to Sections and Articles refer to Chapter 15, Title 23, of the California Code of Regulations.

The following Specifications apply as set forth in the Provisions:

1. General Specifications

- a. During waste disposal, handling, or treatment, no wastes shall be placed in a position where they can be carried into the waters of the State.
- b. The waste management unit shall prevent migration of wastes to adjacent geologic materials, groundwater, or surface water, throughout the closure and post closure periods.
- c. The integrity of containment structures shall be maintained at all times.
- d. The landfill cover must have a slope of no less than 3 percent to permit run-off.

- e. A drainage ditch surrounding the landfill cover must be installed to carry off precipitation draining from the cover.
- f. A 40 mil flexible liner must be installed beneath the topsoil layer of the landfill cover.
- g. The landfill shall be protected from inundation or washout that would result in mobilization of contaminants due to floods with a 100 year return period.
- h. The landfill cover shall meet the design criteria specified in Section 2581.
- i. Drainage around landfill 26 shall be managed to minimize infiltration and water flow into the landfill.

2. Groundwater Sampling and Monitoring Specifications

- a. The groundwater monitoring program shall be in compliance with Sections 2555 (b) through (g), and as approved by the Executive Officer.
- b. The discharger shall conduct monitoring activities in accordance with the Self Monitoring Program to monitor groundwater depth, gradient and quality issued by the Executive Officer, to determine the extent of contamination of the upper unconfined aquifer and deeper zones if contamination is found in the upper aquifer. The discharger shall determine the possible interconnection between water bearing zones and determine the extent of both groundwater and soil contamination.
- c. The discharger shall install groundwater monitoring wells to determine if groundwater contamination has occurred outside the periphery of the landfill. In addition groundwater monitoring must be carried out within the landfill and the surrounding buffer zone. All migration pathways must be monitored.
- d. Both the work plan and final technical reports shall give detailed information regarding the design of each well; the drilling technique being employed, type of equipment used, bore hole diameter, method of determining filter pack and screen slot size, length and diameter of screen, method of soil sample selection, details of well development, rationale for bore hole and well

location, thickness and method of placement of the bentonite seal, proposed bore hole depth, material and method of placement of backfill or annulus seal.

- e. The groundwater sampling and analysis program shall ensure that groundwater quality data are representative of the groundwater in the area of the waste management unit.
- f. Water quality protection standards will be established by the Board according to Section 2552. These standards shall be generated upon submittal of an approved groundwater quality monitoring program and based upon one year of background groundwater quality monitoring data.
- g. A verification monitoring program, as required in Section 2556 and 2557, shall be implemented where water quality impairment has occurred, or upon determination that a statistically significant increase in indicator parameters or waste constituents has occurred during detection monitoring.

C. Provisions

Unless otherwise noted, any references to Sections and Articles refer to Title 23, Chapter 15 of the California Code of Regulations.

- 1. The discharger shall comply with Prohibitions A.1 through A.3 immediately upon adoption of this Order.
- 2. The discharger shall comply with the Specifications above according to the following time schedule:

SUBMIT A SAMPLING AND ANALYSIS PLAN no later than April 30, 1992. The SAP shall furnish detailed descriptions of analytic methods to be used for water and soil analyses both in the proposal and final technical reports.

- 3. SUBMIT A DETAILED PHASE I WORK PLAN no later than October 31, 1992 unless otherwise specified, to include the following:
 - a. Installation of additional monitoring wells upgradient of the landfill, within the landfill and downgradient of the landfill within the buffer zone.

Proposed drilling methods and locations of additional groundwater monitoring wells to assess the impact of the landfill on groundwater and groundwater gradient maps at scalable dimensions based on existing data together with plume isoconcentration maps and hydrogeologic cross sections must accompany the proposal.

- b. Description of the pump tests to be performed both for the extraction and re-injection systems.
 - c. Design of the interim groundwater extraction system along the downgradient perimeter of the landfill.
 - d. Plan for disposal of treated groundwater. This shall include all data on suitability of the alternatives of disposal of treated water, including areas selected for testing for treated water re-injection, data on potential quantity of water to be re-injected together with re-injection well capacity and evaluation of alternative waste water discharge options, including discharge to surface waters and discharge to wastewater treatment plant or outfall.
- 4. The discharger shall submit a final wetland mitigation plan acceptable to CoE San Francisco District and the Executive Officer, no later than October 31, 1992.
 - 5. The discharger shall submit a flood control plan no later than October 31, 1992, to include all necessary control measures to prevent landfill flooding in compliance with Specification B.l.e., B.l.g. and B.l.i. The plan shall assure that flooding conditions in the vicinity of the landfill do not cause groundwater to rise into the landfill and carry contaminants beyond the extraction system.
 - 6. SUBMIT FINAL PHASE I REPORTS no later than October 31, 1993, documenting completion of the Phase I workplan, referred to in Provision 3 and including as built details of the groundwater treatment plant and the interim groundwater extraction system along the downgradient perimeter of the landfill.
 - 7. SUBMIT A TECHNICAL REPORT documenting implementation of the flood control plan acceptable to the Executive Officer no later than December 30, 1993.
 - 8. SUBMIT A TECHNICAL REPORT documenting implementation of the approved wetland mitigation plan no later than December 30, 1994.


9. SUBMIT A DETAILED DESIGN REPORT no later than November 31, 1992, of the landfill cover and the in waste extraction system.
10. SUBMIT A DESIGN REVISION REPORT no later than October 30, 1993 of the groundwater treatment plant if modification of the treatment processes or capacity expansion is needed based on treatment plant operating data collected.
11. SUBMIT A DETAILED PHASE II TECHNICAL REPORT (Closure Certification) documenting completion of work as specified in Provisions 9 and 10 no later than October 30, 1995.
12. In the event that the U.S. Army Corps of Engineers chooses to pursue a more stringent closure alternative, the Board will consider amending this Order and modify the time schedule of the Order for implementation. The U.S. Army Corps of Engineers is not precluded from and is encouraged to test new soil cleanup technology on a portion of the landfill in a way that does not delay implementation of this Order. The test results shall be made available to this Board.
13. The discharger shall submit a technical report, within 6 months after project start-up, evaluating the effectiveness of the hydraulic containment system. Such an evaluation shall include, but need not be limited to, an estimation of the flow capture zones of the extraction wells, establishment of the cones of depression by field measurements, volume of water to be extracted and chemical monitoring data.
14. Monitoring reports shall be submitted quarterly to the Board on the 15th of the second month following the end of the quarter. The report shall cover the previous quarter. On a quarterly basis thereafter, the reports shall include:
 - a) a summary of work performed since the previous report;
 - b) a presentation of updated piezometric surface and water table maps for all affected water bearing zones;
 - c) plan view maps showing the location of all monitoring wells and/or piezometers, at a scalable size.
 - d) Soil and groundwater analytic data
15. All samples shall be analyzed by State certified laboratories using appropriate EPA methods for the type of analysis to be performed. All laboratories shall

maintain quality assurance/quality control records for Board review.

16. Copies of all correspondence, reports and documents pertaining to compliance with the Prohibitions, Specifications and Provisions of this Order shall be provided to the following agencies:
 - a. Department of Health Services, Toxic Substances Control Division.
17. The discharger shall permit the Board or its authorized representative, in accordance to Section 13267 (c) of the California Water Code:
 - a. Entry upon premises in which any pollution sources exist, or may potentially exist, or in which any records are kept, which are relevant to this Order.
 - b. Access to copy any records required to be kept under the terms and conditions of this Order.
 - c. Inspection of any monitoring equipment or methodology implemented in response to this Order.
 - d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.
18. The discharger shall file with the Regional Board a report of any material change in the character, location, or quantity of waste discharge. For the purpose of these requirements, this includes any proposed change in boundaries, contours or ownership.
19. The discharger shall maintain a copy of this Order at the site so as to be available at all times to site operating personnel.
20. The Board considers the property owner and site operator to have a continuing responsibility for correcting any problems within their reasonable control which arise in the future as a result of this Waste Discharge Order.
21. These requirements do not authorize the commission of any act causing injury to the property of another or of the public, do not convey any property rights, do not remove liability under federal, state or local laws, and do not authorize discharge of waste without the appropriate federal, state or local permits, authorizations, or determinations.

22. The Board will review the adequacy of submissions required by Provisions 3, 4 and 5 and revise this Order as necessary.

I, Steven R. Ritchie, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on March 18, 1992.

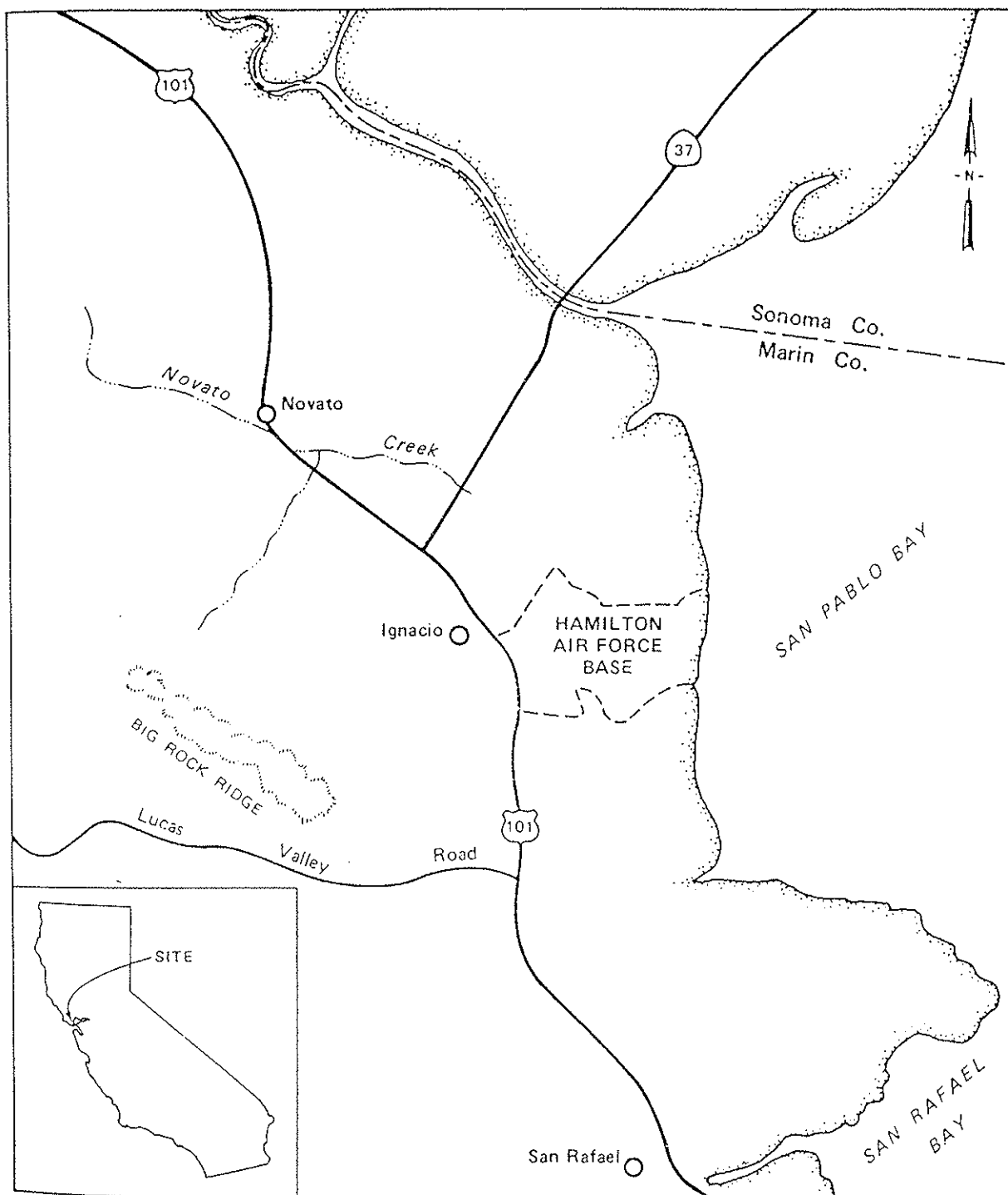


STEVEN R. RITCHIE
Executive Officer

Attachments:

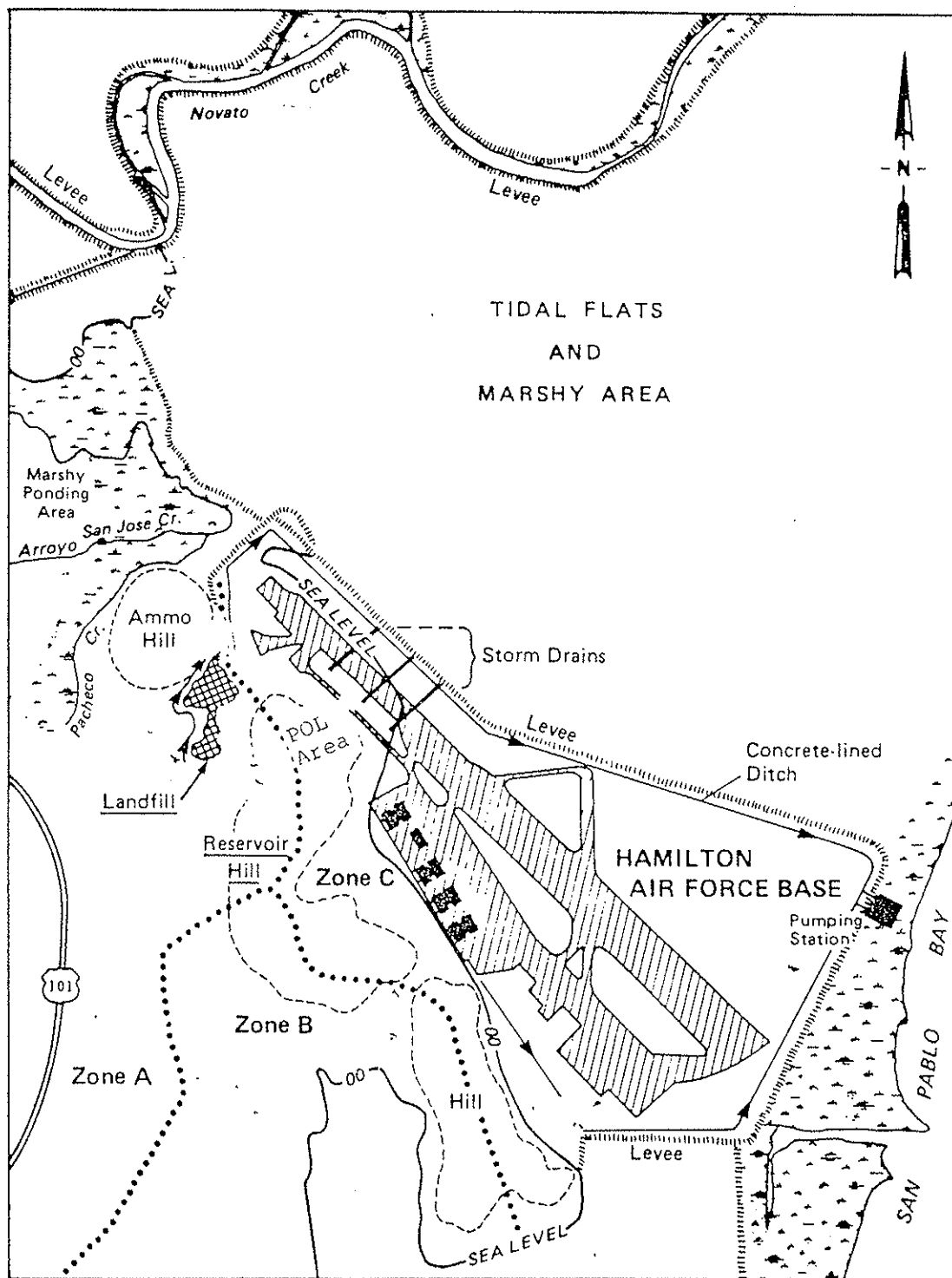
Figure 1: Location Map

Figure 2: Site Map



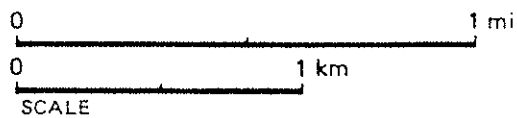
No Scale

Project No. B5C8777D	Hamilton AFB	INDEX MAP TO GENERAL AREA OF STUDY	Figure -1
Woodward-Clyde Consultants			



EXPLANATION

- Watershed divide
- ===== Levee and dikes



	Hamilton AFB	Generalized Hydrogeologic Map of HAFB with Emphasis on the Landfill	Figure 2
Woodward-Clyde Consultants			

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF MONITORING PROGRAM

FOR

U.S. ARMY CORPS OF ENGINEERS.

OMAHA DISTRICT

HAMILTON AIR FORCE BASE

LANDFILL 26

NOVATO, MARIN COUNTY

WASTE DISCHARGE REQUIREMENTS

ORDER NO. 92-029

CONSISTS OF

PART A

AND

PART B

PART A

A. General

1. Reporting responsibilities of waste dischargers are specified in Sections 13225 (a), 13267 (b), 13383, and 13387 (b) of the California Water Code and this Regional Board's Resolution No. 73-16.
2. The principal purposes of a self-monitoring program by a waste discharger are the following:
 - a. To document compliance with waste discharge requirements and prohibitions established by the Board;
 - b. To facilitate self-policing by the waste discharger in the prevention and abatement of pollution arising from waste discharge;
 - c. To develop or assist in the development of effluent standards of performance, pretreatment and toxicity standards, other standards; and,
 - d. To prepare water and water quality inventories.

B. Sampling and Analytical Methods

1. Sample collection, storage, and analyses shall be performed according to the most recent version of Standard Methods for the Analysis of Wastewater, and Test Methods for Evaluating Solid Waste EPA Document SW-846, or other EPA approved methods and in accordance with an approved sampling and analysis plan.
2. Water and waste analysis (except total suspended solids) shall be performed by a laboratory approved for these analyses by the State Department of Health. The director of the laboratory whose name appears on the certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to this Regional Board.
3. All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurements.

4. The discharger must furnish both the extraction and analytic methods to be utilized.

C. Definition of Terms

1. A grab sample is a discrete sample collected at any time.
2. Duly authorized representative is either a named individual or any individual occupying a named position such as the following:
 - a. Authorization is made in writing by a principal executive officer, or,
 - b. Authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as general partner in a partnership, sole proprietorship, the position of plant manager, operator of a well or well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company.

D. Schedule of Sampling, Analysis, and Observations

1. The discharger is required to perform sampling, analysis, and observations according to the schedule specified in Part B, and the requirements of Chapter 15.
2. A statistical analysis shall be performed to determine if the difference between the mean of each sample set and the water quality protection standard is significant and shall be reported annually as described in the current revision of Appendix II of Chapter 15. The discharger may propose an alternative statistical procedure to be used in making this determination pursuant to Section 2555(h) of Chapter 15.

E. Records to be Maintained by the Discharger

1. Written reports shall be maintained by the discharger for groundwater monitoring and wastewater sampling, and shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the Board. Such records shall show the following for each sample.

- a. Identity of sample and sample station number;
- b. Date and time of sampling;
- c. Method of composite sampling (See Section C-Definition of Terms);
- d. Date and time that analyses are started and completed, and name of the personnel performing the analyses;
- e. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used. A reference to a specific section of a reference required in Part A Section B is satisfactory.
- f. Calculation of results;
- g. Results of analyses, and detection limits for each analysis; and,
- h. Chain of custody forms for each sample.

F. Reports to be Filed With The Board

- 1. Written self-monitoring reports shall be filed quarterly except for surface water discharge monitoring which shall be monthly. For quarterly groundwater monitoring reports, written reports shall be filed regularly each 3 months, with the first report due on January 31, 1992. In addition an annual report shall be filed as indicated in G.3. The reports shall be comprised of the following:
 - a. Letter of transmittal - A letter transmitting the essential points in each self-monitoring report should accompany each report. Such a letter shall include a discussion of any requirement violations found during the last reporting period, and actions taken or planned for correcting the violations, such as, operation and/or facilities modifications. If the discharger has previously submitted a detailed time schedule for correcting requirement violations, a reference to the correspondence transmitting such schedule will be satisfactory. If no violations have occurred in the last report period this shall be stated in the letter of transmittal. Monitoring reports and the letter transmitting the monitoring reports shall be signed by a principal executive officer at the level of vice president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates. The letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true, complete, and correct. The letter shall contain the

following certification:

"I certify under penalty of law that this document and all attachments are prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

- b. Each monitoring report shall include a compliance evaluation summary sheet. Until the Order is amended to specify groundwater protection standards, the following shall apply and the compliance sheet shall contain:

- (1) The method and time of water level measurement, the type of pump used for purging, pump placement in well, method of purging, pumping rate, equipment and methods used to monitor field pH, temperature, and conductivity during purging, calibration of the field equipment, results of the pH, temperature, conductivity and turbidity testing, well recovery time, and method of disposing of the purge water; and,

- (2) Type of pump used, pump placement for sampling, a detailed description of the sampling procedure; number and description of equipment, field and travel blanks; number and description of duplicate samples; type of sample containers and preservatives used, the date and time of sampling, the name and qualifications of the person actually taking samples, and any other observations; the chain of custody record.

- c. A summary of the status of any remediation work performed during that quarter. This shall be a brief and concise summary of the work initiated and completed as follows:

- (1) As interim corrective action measures; and
 - (2) To define the extent and rate of migrations of waste constituents in the soil and groundwater at the site.

- d. The discharger shall describe, in the quarterly report, the reasons for significant increases in pollutant concentration at a well onsite. The description shall include the following:
- (1) The source of the increase;
 - (2) How the discharger determined or will investigate the source of the increase; and,
 - (3) What source removal measures have been completed or will be proposed.
- e. On a quarterly basis a map or aerial photograph showing observation monitoring station locations, and chemical isoconcentration maps to assist in defining contaminant distribution in the uppermost and/or deeper aquifer, as appropriate, together with a piezometric surface map shall be included as part of the quarterly Self Monitoring Report.
- f. Laboratory statements of results of analyses specified in Part B must be included in each report. The director of the laboratory whose name appears on the laboratory certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Board. The following information shall be provided.
- (1) The method of sample preparation, analyses and detection limits must be appropriate for the expected concentrations. Specific methods of analyses must be identified. If methods other than EPA approved methods or Standard Methods are used, the exact methodology must be submitted for review; and,
 - (2) In addition to the results of analyses, laboratory quality assurance/ quality control (QA/QC) information must be included in the monitoring report. The laboratory QA/QC information should include the method, equipment and analytical detection limits; the recovery rates; an explanation for any recovery rate that is less than 80%; the results of equipment and method blanks; the results of spiked and surrogate samples; the frequency of quality control analysis; and the name and qualifications of the person(s) performing the analyses.
- g. By March 31 of each year the discharger shall submit an annual report to the Board covering the previous calendar year. This report shall contain:

- (1) Tabular and graphical summaries of the monitoring data obtained during the previous year;
- (2) A comprehensive discussion of the compliance record, and the corrective actions taken or planned which may be needed to bring the discharger into full compliance with the waste discharge requirements; and,
- (3) A written summary of the groundwater analyses indicating any change in the quality of the groundwater.

- h. In the event the discharger violates or threatens to violate the conditions of the waste discharge requirements and prohibitions due to:
 - a. Accidents caused by human negligence or error, or,
 - b. Other causes such as acts of nature.

The discharger shall notify the Regional Board office by telephone as soon as he or his agents have knowledge of the incident and confirm this notification in writing within 7 working days of the telephone notification. The written report shall include time and date, duration and estimated volume of waste bypassed, method used in estimating volume and person notified of the incident. The report shall include pertinent information explaining reasons for the noncompliance and shall indicate what steps were taken to prevent the problem from recurring.

PART B

A. Description of Observation Stations and Schedule of Observations

1. The observation stations shall consist of the ground water monitoring wells. No less than two upgradient and five downgradient wells shall be installed for the potentially affected groundwater aquifer at the points of compliance.
2. An adequate number of monitoring wells shall be installed in the buffer zone of the landfill to define and monitor each water bearing zone within the area and determine groundwater gradient and water quality.
3. Observation stations shall be established to monitor the effectiveness of the extraction well system within the landfill. Pump tests must be conducted, utilizing existing monitoring wells or installing piezometers to determine drawdown.
4. Observation stations must be established for extraction wells located within the buffer zone to monitor the effectiveness of the extraction system. Piezometers must be installed to determine the efficiency of the extraction system.
5. The schedule of observations and grab sampling shall be quarterly and results shall be reported in the months of January, April, July and October.
6. All ground water monitoring well locations shall be surveyed with an accuracy of 0.1 foot both horizontally for location and vertically both at the ground surface and at a marked location at the top of the casing for water level measurement. All water level elevations shall be reported in relation to Mean Sea Level.

B. Observation and Test Procedures

1. The observations shall consist of the following:
 - a. Water level elevation reported to the nearest 0.1 inch for both depth to water from the ground surface and elevation of the ground water level referenced to mean sea level datum;
 - b. Groundwater temperature measured at the time of sampling and reported in degrees fahrenheit;
 - c. Groundwater conductivity measured at the time of sampling as per Standard Methods 205 using potentiometric methodology;
 - d. Ground water pH measured at the time of sampling as per

Standard Methods 423 using potentiometric methodology;

- e. Ground water turbidity measured at the time of sampling and reported in Nephelometric Units (NTUs).
2. The test procedures for the ground water samples shall consist of the following:
- a. Ground water and/or soil analysis for total petroleum hydrocarbons, semi-volatiles, volatiles, pesticides and PCBs together with CAM metals and total dissolved solids as appropriate, using EPA methods and/or the most current revised methods approved by EPA or the RWQCB.
 - b. In the event of increased or extensive pollutant concentration in ground water or soil samples, a revised monitoring program proposal to assure adequate definition of the extent of contamination of pollutants shall be submitted together with analytic results.
 - c. The compliance period for groundwater monitoring shall extend until the waste no longer poses a threat to water quality

Technical Observations and Suggested Criteria

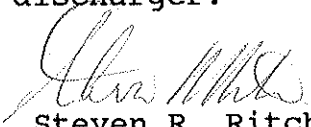
1. Lithologic and analytic soil samples shall be obtained from boreholes completed for installation of monitoring wells. Borehole intervals shall be continuously cored and logged, with samples collected at 5 foot intervals or at lithologic changes.
2. Screen lengths of monitoring wells shall not exceed 10 feet in length except if free floating hydrocarbon product is present. Where a thicker aquifer is present cluster wells must be installed. Screen length must not exceed aquifer thickness. The filter pack must not extend below the base of the screen or more than two feet above the top of the screen. All wells must be screened in the unconfined uppermost and, where indicated, in the second permeable intervals. Well screens shall not monitor more than one permeable zone.
3. Boring logs must show the name of the field geologist logging the hole, name of driller, equipment used, bore hole and casing diameter, location and length of screen, filter pack and seal, elevation of measuring point, time of beginning and ending of well installation, static water level, and sample locations and number. No soil samples are to be composited.
4. Detailed data must be presented on the manner and time of well development. Information must be furnished on number of swabbing or surging cycles performed for each well and volumes

of water removed during each development cycle together with turbidity analyses reported in NTU's obtained during each cycle.

5. All reports must include detailed site and piezometric maps showing monitor well locations. Piezometric data obtained from wells completed in other than the uppermost unconfined aquifer must be shown on separate piezometric surface maps. Lithologic boring logs must be included in the final technical report. All analytic reports shall be included, together with the requirements of Specifications B.2. Analyze for heavy metals, TPH, volatile and semi-volatile organic compounds, pesticides, PCBs and CAM metals as appropriate. Furnish all relevant data in a clear and logical manner and interpret all data.
6. Maps showing the location of soil borings and ground water monitoring wells must be of scalable dimensions. Cross sections showing lithologic detail, location of well screens, filter pack and static water level must be presented in the final report. All monitoring wells and soil borings must be continuously cored and logged in sufficient detail to permit identification of intervals no more than 0.1 foot in thickness.
7. Statistical procedures as outlined in Section 2555 (h) shall be used to determine whether the water quality protection standards have been exceeded.

I, Steven R. Ritchie, Executive Officer, hereby certify that the foregoing Self Monitoring Program is as follows:

1. Developed in accordance with the procedures set forth in this Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in this Board's Order No. 92-029.
2. Effective on the date shown below, and,
3. May be reviewed or modified at any time subsequent to the effective date, upon written notice from the Executive Officer, or request from the discharger.


Steven R. Ritchie
Executive Officer

3/18/92
Date Ordered